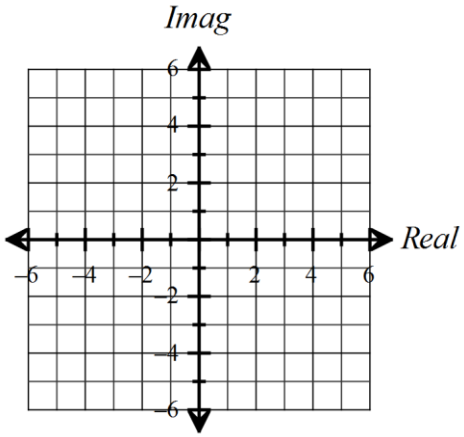
SM 3H

9.4 Trigonometric Form of Complex Numbers 2017-18

Name _____ Date _____ Period _____

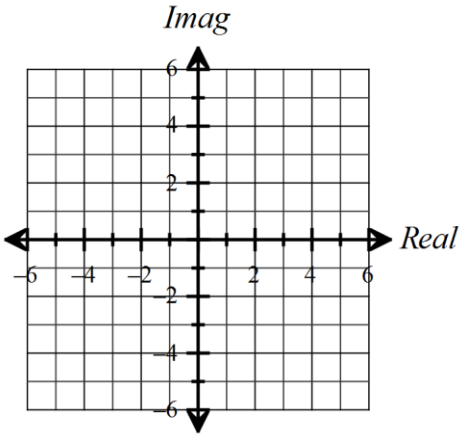
Graph the complex number. Then find its absolute value.

1. $2 - 6i$



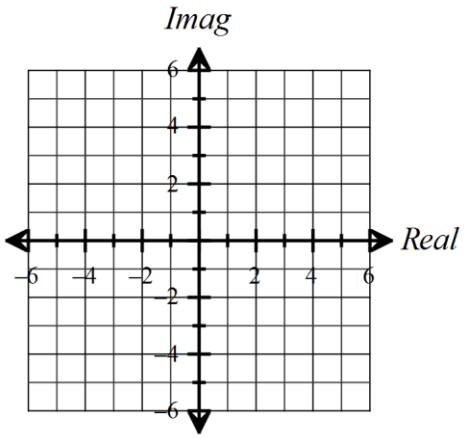
Absolute value_____

2. $-4 + 2i$



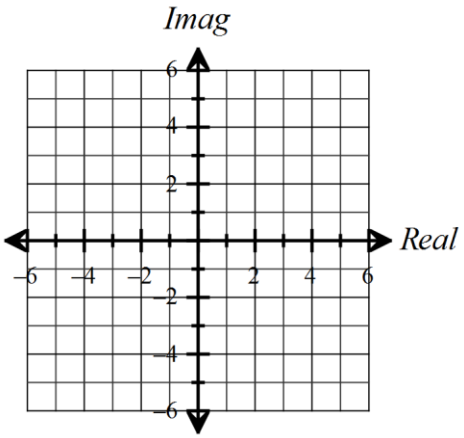
Absolute value_____

3. $6i$



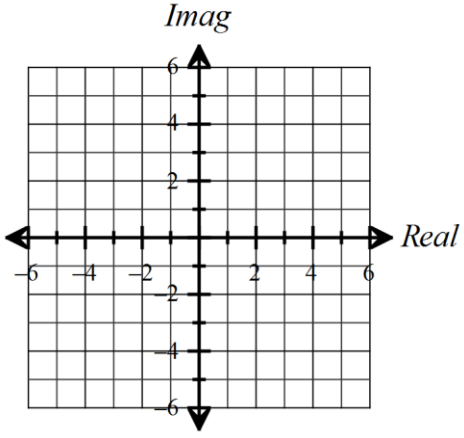
Absolute value_____

4. -4



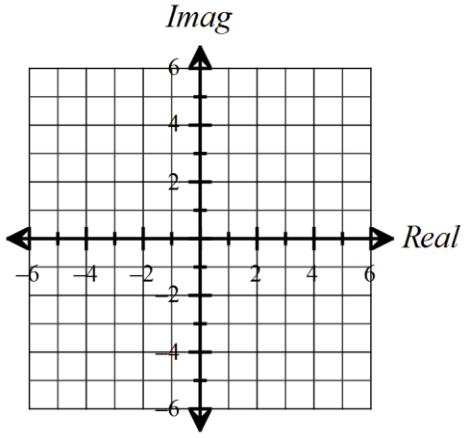
Absolute value_____

5. $-4i$



Absolute value_____

6. $-1 - 3i$



Absolute value_____

Write the complex number in trigonometric form, using degree measure for the argument.

7. $-3+3i$

8. $4-4i$

9. 8

10. $i\sqrt{3}$

11. $-\sqrt{3}+i$

12. $3+4i$

Write the complex number in the form $\boldsymbol{a+bi}$.

13. $\sqrt{2}(\cos 45° + i \sin 45°)$

14. $3(\cos 90° + i \sin 90°)$

15. $\sqrt{3}\left(\cos\frac{\pi}{3} + i \sin\frac{\pi}{3}\right)$

16. $2\left(\cos\frac{7\pi}{6} + i \sin\frac{7\pi}{6}\right)$

Perform the indicated operation. Write the answer in the form of $a + bi$. Round answers to the nearest hundredth if necessary.

17. $2(\cos 150° + i \sin 150°) \cdot 3(\cos 300° + i \sin 300°)$

18. $5\left(\cos\frac{\pi}{4} + i \sin\frac{\pi}{4}\right) \cdot 3(\cos \pi + i \sin \pi)$

19. $\frac{4\left(\cos\frac{\pi}{3}+i \sin\frac{\pi}{3}\right)}{2\left(\cos\frac{\pi}{6}+i \sin\frac{\pi}{6}\right)}$

20. $\frac{3(\cos 1800°+i \sin 1800°)}{6(\cos 360°+i \sin 360°)}$

21. $\sqrt{2}(\cos 118° + i \sin 118°) \cdot \frac{1}{2}(\cos(-19°) + i \sin(-19°))$

22. $\frac{2\left(\cos\frac{13\pi}{6}+i \sin\frac{13\pi}{6}\right)}{3\left(\cos\frac{\pi}{3}+i \sin\frac{\pi}{3}\right)}$

23. $\sqrt{3}(\cos 10° + i \sin 10°) \cdot \sqrt{2}(\cos 20° + i \sin 20°)$

24. $\frac{4.1(\cos 36.7°+i \sin 36.7°)}{8.2(\cos 84.2°+i \sin 84.2°)}$

Find the product for each pair of complex numbers, using trigonometric form. Write the answer in the form of $a + bi$. Round answers to the nearest hundredth if necessary.

25. $z_1 = 4 + 4i,\ z_2 = -5 - 5i$

26. $z_1 = 3 + 4i,\ z_2 = -5 - 2i$

27. $z_1 = 2 - 6i,\ z_2 = -3 - 2i$

28. $z_1 = 2 - 3i,\ z_2 = 1 - \sqrt{3}i$

Find the quotient for each pair of complex numbers, using trigonometric form. Write the answer in the form of $a + bi$. Round answers to the nearest hundredth if necessary.

29. $z_1 = 4 + 4i,\ z_2 = -5 - 5i$

30. $z_1 = 3 + 4i,\ z_2 = -5 - 2i$

31. $z_1 = 2 - 6i,\ z_2 = -3 - 2i$

32. $z_1 = 2 - 3i,\ z_2 = 1 - \sqrt{3}i$

Find the product of the given complex number and its complex conjugate in trigonometric form. Show work!

33. $3\left(\cos\frac{\pi}{6} + i\sin\frac{\pi}{6}\right)$

34. $2(\cos 7° + i\sin 7°)$

35. $\sqrt{2}\left(\cos\frac{\pi}{4} + i\sin\frac{\pi}{4}\right)$

36. $5(\cos 313° + i\sin 313°)$